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Davidson

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(54) **ANCHOR BOLT SUPPORTING TEMPLATE FOR A CONCRETE MOLD AND MOLD ASSEMBLY AND METHOD OF ASSEMBLING ANCHOR BOLTS WITH A MOLD**

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E04G 17/00 (2006.01)
B25B 27/14 (2006.01)

(52) **U.S. Cl.** **29/469**; 29/281.6; 264/35; 52/741.15; 52/745.21; 249/51; 249/93; 33/644; 33/645

(58) **Field of Classification Search** 249/34, 249/91, 93, 48, 49, 51; 33/518, 613, 644, 33/645; 52/295, 741.15, 745.21; 29/469, 29/281.6; 264/35
See application file for complete search history.

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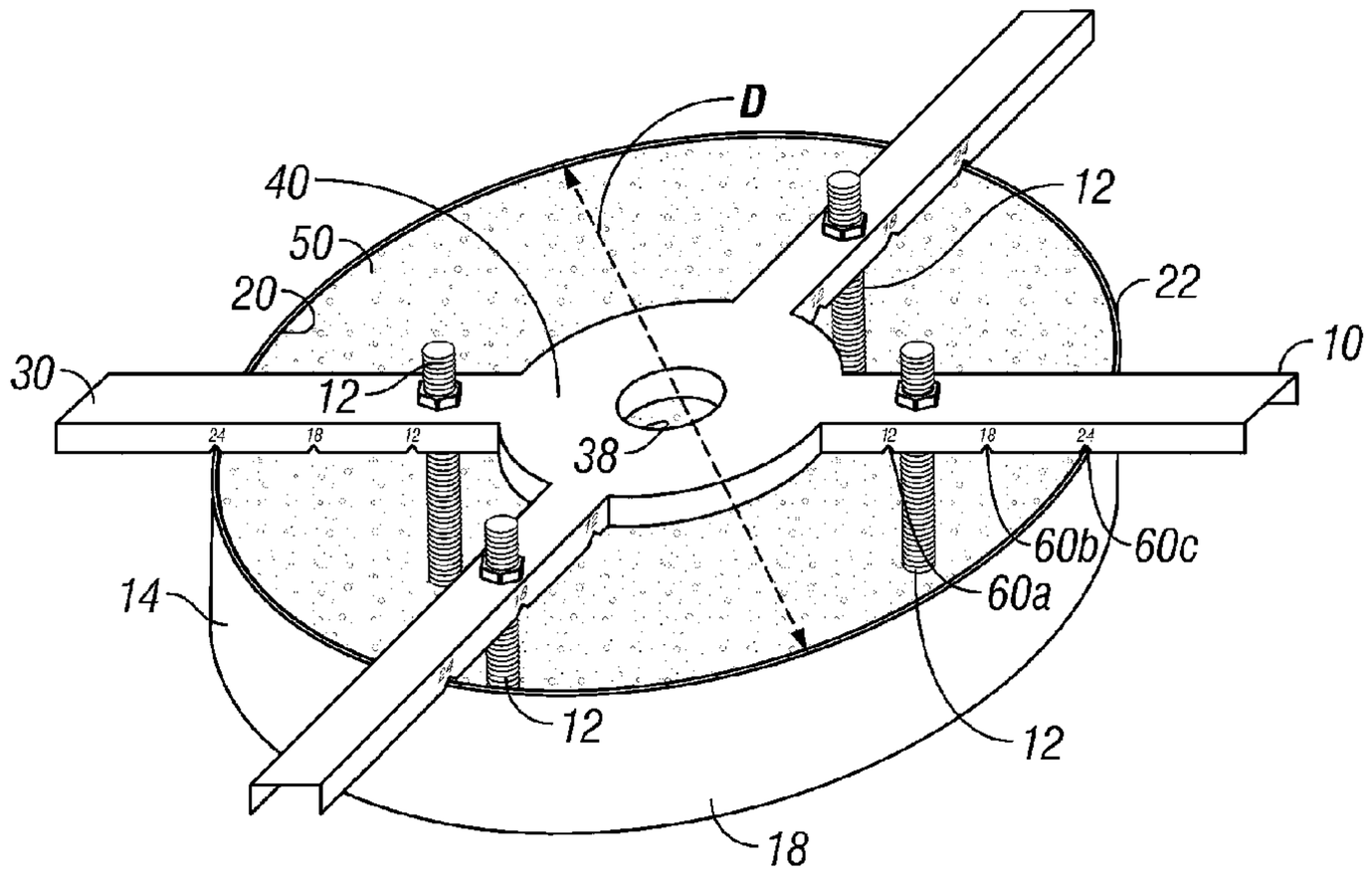
(57) **ABSTRACT**

An anchor bolt template for use with cardboard molds used to form concrete into footings and other foundations. The template is integrally formed of plastic or some other resilient, light weight material. The most common bolt configuration includes four bolts spaced equal distances from the foundation's center. Thus, the preferred template shape is four arms extending radially from a hub. Each of the arms has bolt location markers labeled with the diameters of several bolt patterns. The arms may be generally C-shaped in cross section so that the depending edges ride on the upper edge of the mold, supporting the lower anchor bolt nut above the concrete. Notches, preferably labeled by mold size, on the bottom of the depending edges of the arms receive the upper edge of the mold so that as heavy concrete is poured into the cardboard mold the sidewall of the mold will not deform.

23 Claims, 2 Drawing Sheets



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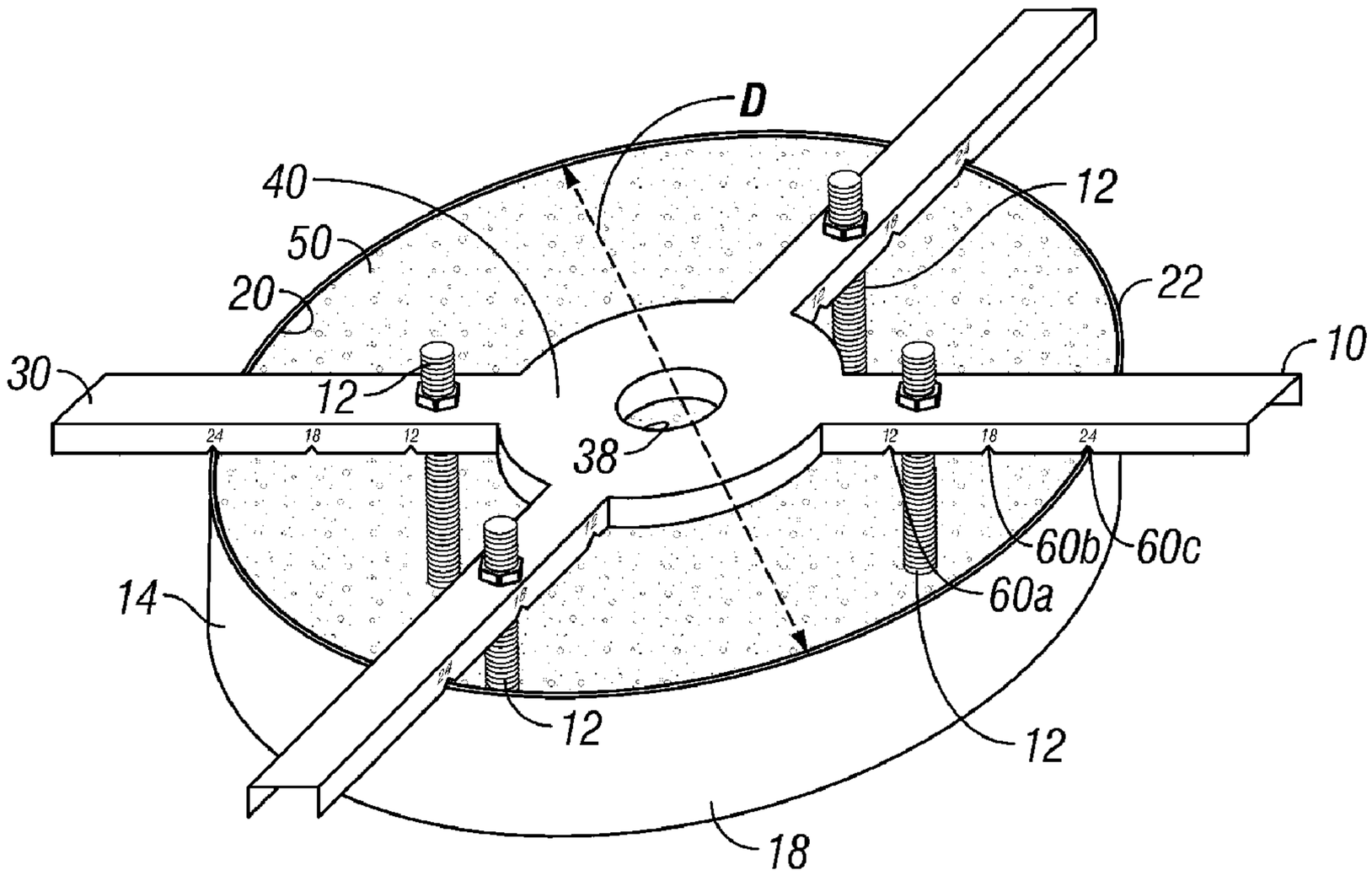
D
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60b
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FIG. 1

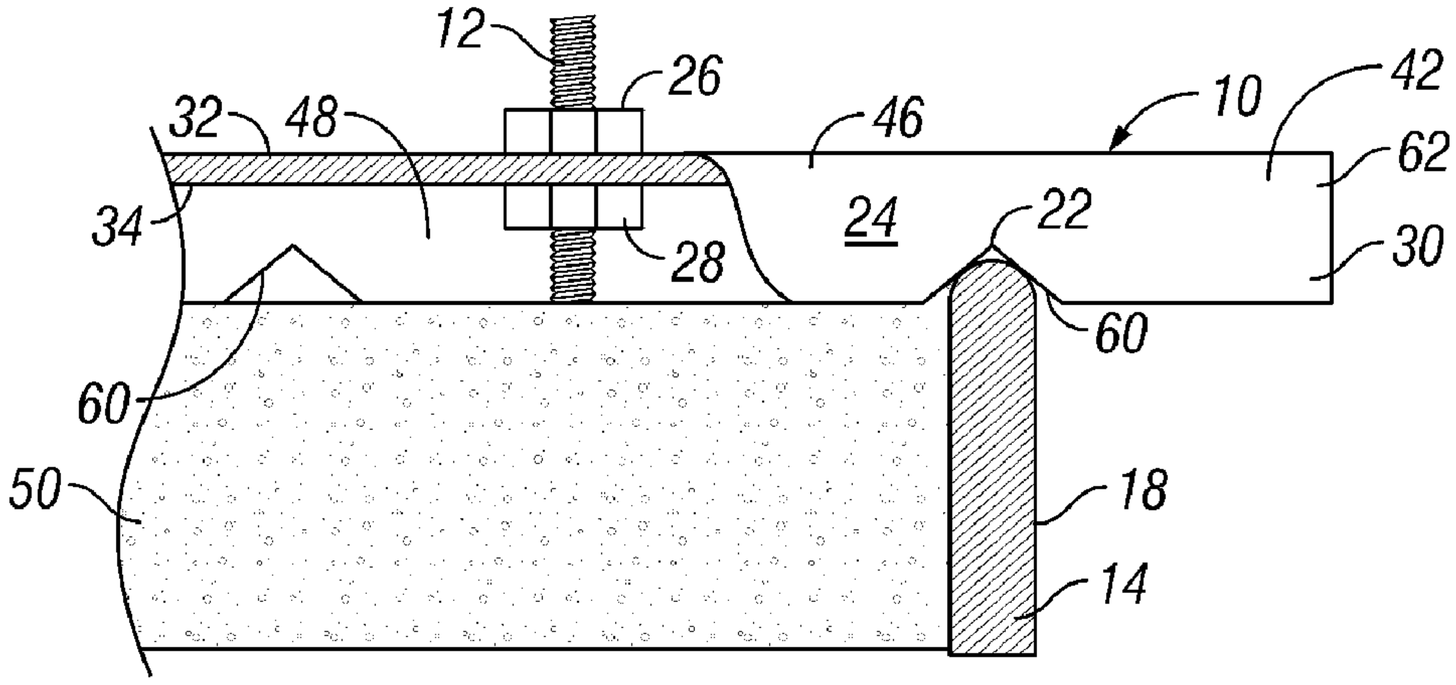
12
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FIG. 2

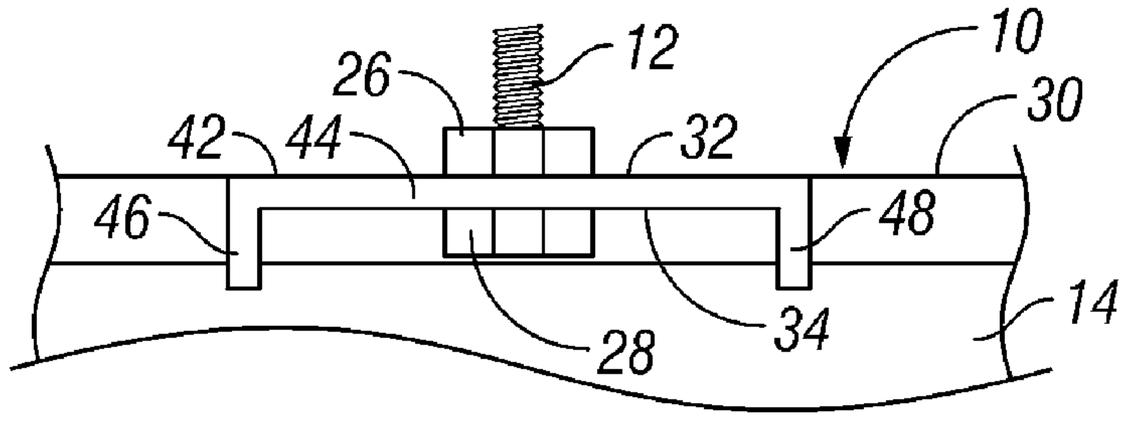

FIG. 3

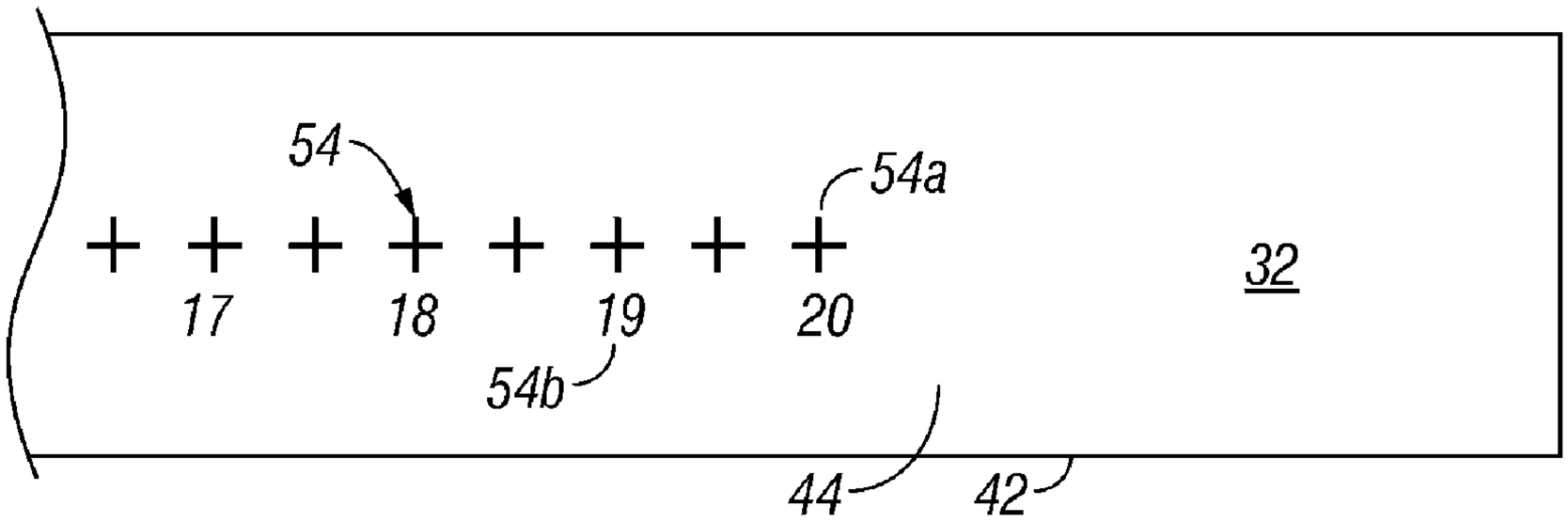

FIG. 4

ANCHOR BOLT SUPPORTING TEMPLATE FOR A CONCRETE MOLD AND MOLD ASSEMBLY AND METHOD OF ASSEMBLING ANCHOR BOLTS WITH A MOLD

FIELD OF THE INVENTION

The present invention relates generally to devices for supporting anchor bolts in concrete and, more particularly but without limitation, to templates for supporting such bolts in a cardboard mold while the concrete inside hardens.

BACKGROUND OF THE INVENTION

Poles that support traffic signals, parking lot lights, street lights, and other traffic and lighting fixtures usually are mounted on top of a subsurface concrete footing. The base of the pole is attached to the footing by means of anchor bolts embedded in the footing. The number, size and configuration of these anchor bolts are standardized, and the pole bases are constructed in accordance with these standards. Thus, correct positioning of the anchor bolts during formation of the footings is important to later installation of the poles. The present invention addresses this need with a preformed plastic template that can be used to support the anchor bolts within the mold in a selected arrangement while the concrete is poured and allowed to set. While the bolt supporting template of this invention is particularly useful in the placement of concrete footings for poles supporting traffic and lighting fixtures, other applications will be readily apparent.

SUMMARY OF THE INVENTION

The present invention comprises an anchor bolt template used to support a plurality of anchor bolts in at least a first pattern inside a concrete mold. The mold comprises a side wall terminating at an open top having a diameter and defined by an upper edge. The template comprises an integrally formed body sized for placement over the open top of the mold, the body having an upper surface and a lower surface. At least a first set of notches is formed on the lower surface of the body. The notches are positioned at circumferentially spaced points corresponding to points on the upper edge of the mold. The notches are sized to receive the upper edge of the mold so that, when the template is fitted on the open top of the mold and as concrete is poured into the mold, the side walls of the mold resist deformation by the concrete. At least a first set of bolt locator indicia is provided on the body, the first set of indicia representative of bolt locations arranged in a first bolt pattern.

Further, the present invention comprises an anchor bolt template to support a plurality of anchor bolts in at least a first pattern inside a concrete mold. The mold comprises a side wall terminating at an open top having a diameter and defined by an upper edge. Each of the anchor bolts comprises a first nut and a second nut for engaging the template therebetween. The template comprises an integrally formed body sized for placement over the open top of the mold, the body having an upper surface and a lower surface. At least a first set of bolt locator indicia is provide on the upper surface of the body, the first set of indicia representative of bolt locations arranged in a first bolt pattern. Thus, when the anchor bolts are inserted through the template at the bolt locations, the first nut will engage the upper surface of the template and the second nut will engage the lower surface of the template. A spacer is included on the lower surface of the body. The spacer is sized and positioned to support the lower surface of the body a distance from the upper edge of the mold, the distance being at least about the width of the second nut.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of the anchor bolt template of the present invention shown positioned over a cylindrical mold and supporting four anchor bolts therein in a standard formation.

FIG. **2** is a fragmented, partially sectional side elevation view of one of the arms of the anchor bolt template of FIG. **1**.

FIG. **3** is a fragmented view of the template shown in FIG. **1** showing the end of the arm positioned over the edge of the mold.

FIG. **4** is an enlarged, fragmented plan view of one of the arms of the template illustrating the drill starts and the indicia indicating the diameter of the bolt patterns.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Turning now to the drawings in general and to FIG. **1** in particular, there is shown therein a bolt supporting template constructed in accordance with the present invention and designated generally by the reference numeral **10**. The template **10** is designed to support a plurality of anchor bolts, designated collectively at **12**, in at least a first pattern inside a concrete mold **14**.

The mold **14** typically is a commercially available cardboard mold form. While the mold is usually cylindrical, it will be apparent that the template **10** as shown will accommodate other mold shapes, such as square. In addition, the shape of the template **10** may be modified to suit other shapes of molds. Generally, the mold **14** has a side wall **18** terminating at an open top **20** defined by an upper edge **22** and having diameter indicated at "D.".

Referring now to FIG. **2**, the anchor bolts **12** each will comprise at least a first nut **26** for supporting the bolt on the template **10**. More preferably, each bolt **12** further comprises a second nut **28** for engaging the template **10** therebetween. See also FIG. **4**.

With continuing reference to FIGS. **1** and **2**, the template **10** preferably comprises an integrally formed body **30** sized for placement over the open top **20** of the mold **14**. The body **30** has an upper surface **32** and a lower surface **34**. Now it will be seen that the first nut **26** engages the upper surface **32** and the second nut **28** engages the lower surface **34**.

While the configuration of the body **30** may vary, a preferred form comprises a center or hub **40** and a plurality or arms **42** extending radially from the hub. The center of the hub **40** usually will be formed with an opening **38** therethrough to receiving wiring typically contained in a center bore (not shown) in the concrete footing. The arms **42** may have various shapes, but a preferred configuration is generally C-shaped, that is a flat central spine **44** with opposing edges **46** and **48** depending therefrom. The length of the edges **46** and **48** should be at least about the same as the width of the second nuts **28**, as shown in FIGS. **2** and **3**. This allows the edges **46** and **48** to serve as a spacer sized and positioned to support the lower surface **34** of the body **30** a distance from the upper edge **22** of the mold **14**. Now it will be understood that this spacer—the edges **46** and **48**—causes the bottom or second nut **28** to remain above the level of the concrete **50** when the mold **14** is filled.

As previously stated, the bolt configurations are standardized. Most commonly, there are 4 bolts arranged in a circle equal distances apart. The diameter of this circular pattern,

however, varies from job to job, typically being 20 inches or less. To facilitate the proper placement of the bolt holes in the template **10**, at least a first set of bolt locator indicia, indicated generally at **54**, is provided on the body **30** of the template **10**, as seen in FIG. **4** to which attention now is directed. Where the template **10** is formed as shown herein with four radially extending arms **42** (only one of which is seen in FIG. **4**), the indicia **54** conveniently is placed on the upper surface **32** of each arm.

The bolt indicia **54** may comprise notches, cross or hash marks, or other surface interruptions which, in addition to indicating a selected position, may also serve as drill starts. Alternately, the bolt indicia **54** may comprise number or lettering. More preferably, the indicia **54** comprises a combination of notches or dimples that serve as drill starts and numbers indicating the diameter of the bolt pattern in inches. For example, each arm **42** preferably is marked with dimples or hash marks at half inch intervals and numbers, such as "20," "19," "18," and so forth, at each inch interval, as illustrated in the enlarged view of the arm **42** in FIG. **4**.

Even more preferably, a plurality of sets of bolt locator indicia **54** is provided on the arms **42**. For example, the bolt locator indicia **54** could comprise a first set of indicia **54***a* representative of bolt locations arranged in a first bolt pattern with the bolts positioned in a 20 inch circular pattern and a second set of indicia **54***b* representative of bolt locations arranged in a second bolt pattern at 19 inches. Now it will be apparent that many sets of indicia **54** corresponding to a large number of patterns could be included on the template **10**.

As indicated previously, the molds used to form the concrete for the footings typically are formed of cardboard. While lightweight and inexpensive, this material may deform as the concrete **50** is poured, resulting in a misshapen footing. The present invention addresses this problem. While supporting the bolts **12** in a desired pattern while the concrete **50** is poured and sets, the template **10** of the present invention can also provide additional support for the sidewalls **18** of the mold **14**. To this end, notches, designated generally at **60**, may be formed on the lower surface **34** of the body **30**, more particularly, on the lowermost aspect of the edges **46** and **48**, as seen in FIGS. **1** and **2**.

For example, at least a first set of notches **60***a* may be positioned at circumferentially spaced points corresponding to points on the upper edge **22** of the mold **14** with which template **10** will be used. It will be noted that, where notches **60** are to be provided in the edges **46** and **48**, the length of the edges should be extended so as to be slightly greater than the width of the second nuts **28** to offset the depth of the notches.

The cardboard molds **14** are available in a range of standard sizes or diameters indicated at "D" in FIG. **1**, including 12, 18 and 24 inches. Accordingly, the first set of notches **60***a* may be positioned and sized to receive the edge **22** of a 24-inch diameter mold cylinder. In this way, when the template **10** is fitted on the open top **20** of the mold **14** and as concrete **50** is poured into the mold, the side wall **18** of the mold will resist deformation under the weight of the concrete.

Now it will be seen that the template **10** advantageously may be adapted for use with several sizes of molds, each size having a different diameter "D." Thus, the notches **60** may further include a second set of notches **60***b*, the notches **60***a* and **60***b* positioned to receive two different diameters of molds. Even more desirably, the template **10** may include a third set of notches **60***c*. Thus, the one template **10** is useable with 12-inch, 18-inch and 24-inch diameter molds.

As used herein, "notch" refers to any of a wide range of shapes and sizes of recesses, such as grooves, channels and the like, whether arranged circumferentially or radially, which are adapted to engage the edge of the mold **14**. The specific configurations of the notches **60** will vary depending on the configuration of the template **10** as well as the style of mold **14** with which it is intended to be used.

The template **10** may comprise mold size indicia **62** relative to the notches **60**, the size indicia representative of the diameter of the corresponding mold diameter "D," as seen best in FIG. **2**. Ideally, these size indicia may be provided on the sides of the arms **42**, such as on one or both of the edges **46** and **48**.

The template may be manufactured by several means. Preferred fabrication methods include injection and vacuum molding. The material may vary, but plastic is preferred. The material should be slightly resilient, light weight and waterproof. A particular preferred material is ultraviolet-stabilized plastic.

The use of the template **10** is apparent from the forgoing description and, therefore, will only be summarized briefly. First, the site for the footing is selected, and the earth is excavated to form a hole of sufficient size to receive a selected mold **14**. Next, the mold is positioned in the hole in a conventional manner. Once the mold is positioned, the selected group of notches **60**—12-inch, 18-inch or 24-inch—are pressed on the upper edge **22** of the mold **14**, thereby holding the mold in its intended shape. Wires, if any, are pulled up through the empty mold **14** and fed through the opening **38**. Bolt holes are drilled through the arms **42** of the template **10**, according to the predetermined bolt pattern. Next, the bolts **12** are positioned in the arms **42** and secured with the first and second nuts **26** and **28**. With the bolts **12** properly suspended over the empty mold **14**, and the edge **22** of the mold supported in its desired shape, concrete **50** is poured into the mold to the desired level. Because the second nuts **28** are supported just above the upper edge **22** of the mold **14**, the nuts are not embedded in the concrete **50**. Once the concrete **50** has set, the upper nuts **26** are removed and the template **10** is lifted offer. Finally, the mold **14** is removed and the surrounding area is back filled with earth in the usual manner.

Changes can be made in the combination and arrangement of the various parts and elements described herein without departing from the spirit and scope of the invention as defined in the following claims.

What is claimed is:

1. A method for supporting a plurality of anchor bolts in at least a first pattern in wet concrete to form a concrete footing, wherein each of the anchor bolts comprises a first nut and a second nut for engaging the template therebetween, the method comprising:

providing at least one concrete mold, each concrete mold comprising a side wall terminating at an open top having a diameter and defined by an upper edge;

providing an anchor bolt template comprising:

an integrally formed body sized for placement over the open top of the mold, the body having an upper surface and a lower surface;

at least a first set of bolt locator indicia on the upper surface of the body, the first set of indicia representative of bolt locations arranged in a first bolt pattern, whereby, when the anchor bolts are inserted through the template at the bolt locations, the first nut will engage the upper surface of the template and the second nut will engage the lower surface of the template;

a spacer on the lower surface of the body sized and positioned to support the lower surface of the body a distance from the upper edge of the mold, the distance being at least about the width of the second nut; and

attaching the anchor bolts to the template using the first and second nuts; and

positioning the template on the upper edge of the mold.

2. The method of claim **1** wherein the body of the template is formed by a hub and a plurality of arms extending radially from the hub.

3. The method of claim **2** wherein the at least one concrete mold comprises a plurality of concrete molds each having a different diameter, wherein the template is adapted for use with a plurality of different mold diameters, wherein the at least one set of bolt locator indicia comprises a first set and a second set of bolt locator indicia, wherein the second set of bolt locator indicia set corresponds to a second bolt pattern, and wherein the method further comprises selecting one of the plurality of molds and selecting the first or second set of bolt locator indicia sized for the selected mold.

4. The method of claim **3** wherein the template further comprises size indicia relative to the bolt locator indicia representative of the diameter of the first and second bolt patterns.

5. The method of claim **1** wherein the body of the template is formed by a hub and a plurality of arms extending radially from the hub, and wherein each arm is generally C-shaped forming a spine with opposing depending edges so that the pair of depending edges form the spacer, and wherein the template positioning step comprises placing the template over the mold so that the depending edges of the template contact the upper edge of the mold.

6. The method of claim **1** wherein the template further comprises size indicia relative to the bolt locator indicia representative of the diameter of the first bolt pattern.

7. An assembly for supporting a plurality of anchor bolts in concrete in at least a first pattern, wherein each of the anchor bolts comprises a first nut and a second nut for engaging the template therebetween, the assembly comprising:

at least one concrete mold comprising a side wall terminating at an open top having a diameter and defined by an upper edge; and

a template comprising:

an integrally formed body sized for placement over the open top of the mold, the body having an upper surface and a lower surface;

at least a first set of bolt locator indicia on the upper surface of the body, the first set of indicia representative of bolt locations arranged in a first bolt pattern, whereby, when the anchor bolts are inserted through the template at the bolt locations, the first nut will engage the upper surface of the template and the second nut will engage the lower surface of the template;

a spacer on the lower surface of the body sized and positioned to support the lower surface of the body a distance from the upper edge of the mold, the distance being at least about the width of the second nut.

8. The assembly of claim **7** wherein the body of the template is formed by a hub and a plurality of arms extending radially from the hub.

9. The assembly of claim **8** wherein the at least one concrete mold comprises a plurality of concrete molds each having a different diameter, wherein the template is adapted for use with a plurality of mold sizes, each size having a different diameter, wherein the at least one set of bolt locator indicia comprises a first set and a second set of bolt locator indicia, and wherein the second set of bolt locator indicia set corresponds to a second bolt pattern.

10. The assembly of claim **9** wherein the template further comprises size indicia relative to the bolt locator indicia representative of the diameter of the first and second bolt patterns.

11. The assembly of claim **7** wherein the body of the template is formed by a hub and a plurality of arms extending radially from the hub, and wherein each arm is generally C-shaped forming a spine with opposing depending edges so that the pair of depending edges form the spacer.

12. The assembly of claim **7** wherein the template further comprises size indicia relative to the bolt locator indicia representative of the diameter of the first bolt pattern.

13. An anchor bolt template to support a plurality of anchor bolts in at least a first pattern inside a concrete mold, the mold comprising a side wall terminating at an open top having a diameter and defined by an upper edge, the template comprising:

an integrally formed body sized for placement over the open top of the mold, the body having an upper surface and a lower surface;

at least a first set of notches formed on the lower surface of the body, wherein the notches are positioned at circumferentially spaced points corresponding to points on the upper edge of the mold, and wherein the notches are sized to receive the upper edge of the mold so that when the template is fitted on the open top of the mold and as concrete is poured into the mold, the side walls of the mold resist deformation by the concrete;

at least a first set of bolt locator indicia on the body, the first set of indicia representative of bolt locations arranged in a first bolt pattern;

wherein each of the anchor bolts for use with the template comprises a first nut for engaging the upper surface of the template and a second nut for engaging the lower surface of the template; and

a spacer on the lower surface of the body sized and positioned to support the lower surface of the body a distance from the upper edge of the mold, the distance being at least about the width of the second nut.

14. The anchor bolt template of claim **13** wherein the body is formed by a hub and a plurality of arms extending radially from the hub, wherein each arm is generally C-shaped forming a spine with opposing depending edges so that the pair of depending edges form the spacer, and wherein the at least first set of notches are formed in the depending edges.

15. The anchor bolt template of claim **14** wherein the template is adapted for use with a plurality of sizes of molds, each size having a different diameter, wherein the at least a first set of notches comprises a first set and a second set of notches, each set of notches arranged to receive a different one of the plurality of mold sizes, wherein the at least one set of bolt locator indicia comprises a first set and a second set of bolt locator indicia, wherein the second set of bolt locator indicia set corresponds to a second bolt pattern.

16. An anchor bolt template to support a plurality of anchor bolts in at least a first pattern inside a concrete mold, the mold comprising a side wall terminating at an open top having a diameter and defined by an upper edge, the template comprising:

an integrally formed body sized for placement over the open top of the mold, the body having an upper surface and a lower surface, wherein the body is formed by a hub and a plurality of arms extending radially from the hub, wherein each arm is generally C-shaped forming a spine with opposing depending edges;

at least a first set of notches formed on the lower surface of the body, wherein the notches are positioned at circum-

ferentially spaced points corresponding to points on the upper edge of the mold, wherein the at least first set of notches are formed in the depending edges of the arms of the body, and wherein the notches are sized to receive the upper edge of the mold so that when the template is fitted on the open top of the mold and as concrete is poured into the mold, the side walls of the mold resist deformation by the concrete; and

at least a first set of bolt locator indicia on the body, the first set of indicia representative of bolt locations arranged in a first bolt pattern.

17. The anchor bolt template of claim **16** wherein the template is adapted for use with a plurality of sizes of molds, each size having a different diameter, wherein the at least a first set of notches comprises a first set and a second set of notches, each set of notches arranged to receive a different one of the plurality of mold sizes, wherein the at least one set of bolt locator indicia comprises a first set and a second set of bolt locator indicia, and wherein the second set of bolt locator indicia set corresponds to a second bolt pattern.

18. An anchor bolt template to support a plurality of anchor bolts in at least a first pattern inside a concrete mold, the mold comprising a side wall terminating at an open top having a diameter and defined by an upper edge, wherein each of the anchor bolts comprises a first nut and a second nut for engaging the template therebetween, the template comprising:

an integrally formed body sized for placement over the open top of the mold, the body having an upper surface and a lower surface, wherein the body is formed by a hub and at least three arms extending radially from the hub;

at least a first set of bolt locator indicia on the upper surface of the body, the first set of indicia representative of bolt locations arranged in a first bolt pattern, whereby, when the anchor bolts are inserted through the template at the bolt locations, the first nut will engage the upper surface of the template and the second nut will engage the lower surface of the template;

a spacer on the lower surface of the body sized and positioned to support the lower surface of the body a distance from the upper edge of the mold, the distance being at least about the width of the second nut.

19. The anchor bolt template of claim **18** wherein the at least three arms comprises four arms.

20. The anchor bolt template of claim **18** wherein the template is adapted for use with a plurality of sizes of molds, each size having a different diameter, wherein the at least one set of bolt locator indicia comprises a first set and a second set of bolt locator indicia, wherein the second set of bolt locator indicia set corresponds to a second bolt pattern.

21. The anchor bolt template of claim **20** wherein the template further comprises size indicia relative to the bolt locator indicia representative of the diameter of the first and second bolt patterns.

22. The anchor bolt template of claim **18** wherein each arm of the template is generally C-shaped forming a spine with opposing depending edges so that the pair of depending edges form the spacer.

23. The anchor bolt template of claim **18** wherein the template further comprises size indicia relative to the bolt locator indicia representative of the diameter of the first bolt pattern.

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